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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,784	11/28/2001	Akira Yamamoto	P21675	8367

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EXAMINER

BELYAVSKYI, MICHAEL A

ART UNIT	PAPER NUMBER
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1644

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/994,784	Applicant(s) YAMAMOTO ET AL.	
	Examiner Michail A Belyavskyi	Art Unit 1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3- 16, 18-31 is/are pending in the application.
- 4a) Of the above claim(s) 16, 18 -30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3 -15 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The finality of the rejection of the last Office Action, mailed on 09/10/04 is hereby withdrawn since the after-final amendments filed on 07/14/04 were not previously entered.

Claims 1, 3- 16, 18-31 are pending.

2. Claims 16, 18 -30 stand withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b) as being drawn to a nonelected invention.

Claims 1, 3 -15 and 31 drawn to a carrier having immobilized antibodies are under consideration in the instant application.

In view of the amendment, filed 07/29/04 the following rejection remains:

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3 - 15 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitano et al (GB 2282548) or Mitoh et al (GB2307552, IDS) each in view of Nakayama et al (US Patent 5,827,669) and further in view of Jonson et al (US Patent 4,885,207) for the same reasons set forth in the Previous Office Action, mailed 03/10/04.

Applicant's arguments, filed 07/29/04 have been fully considered, but have not been found convincing.

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Applicant asserts that : (i) neither GB'548 nor GB '552 teaches or suggests a carrier wherein the antigens or antibodies are immobilized to the surface of the carrier through their portion that are irrelevant to the antigen-antibody reaction like the present invention; (ii) the previous rejection has not responded to Applicant's arguments relating to disclosed and claimed substantially spherical carrier and that no combination of prior art suggests or teaches the substantially spherical carrier ; (iii) although GB'548 disclosed bonding between ligands and antigens , the antibodies are immobilized to the carrier before blocking is carried out and this process is distinguished from the present invention where the blocking is provided after the antigen is provided.

Contrary to Applicant's assertion it is the Examiner position, that the prior art teaches that antigens or antibody are immobilized to the surface of the carrier through their portion that are irrelevant to the antigen-antibody reaction. Applicant's attention is respectively drawn, for example, to page 3 of the GB'548. GB'548 explicitly teaches that the present invention is to provide a diagnostic agent wherein antibody or antigen are immobilized to the surface of the carrier, wherein said diagnostic agent can be used in the antigen-antibody reaction with high degree of sensitivity, reproducibility and reliability. In other words, the invention of GB'548 was that antigens or antibodies are immobilized to the surface of the carrier through their portion that are irrelevant to the antibody-antigen reaction. The whole purposed of the diagnostic agent taught by GB'548 is to immobilized antigens or antibodies through the irrelevant portion, thus maintaining the relevant portion of said antigens or antibodies for high bonding ability in the samples to be diagnosed.

With regards to the issue that the previous rejection has not responded to Applicant's arguments relating to disclosed and claimed substantially spherical carrier.

Contrary to Applicant's assertion, as was stated in the previous Office Action, GB'548 explicitly teaches a carrier having a substantially spherical shape. (see Applicant's attention is respectively directed to Fig.1, 2 and 3 of said patent in particular. It is the Examiner position that the shape of the carrier shown in Fig.1,2 and 3 of GB'548 is substantially spherical.

In response to applicant's arguments that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine* 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones* 21 USPQ2d 1941 (Fed. Cir. 1992). The strongest rationale for combining reference is a recognition, expressly or implicitly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent that some advantage or expected beneficial result would have been produced by their combination *In re Sernaker* 17 USPQ 1, 5-6 (Fed. Cir. 1983) see MPEP 2144.

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In this case, GB '548 teaches a carrier having a surface formed of a calcium phosphate compound and antibody, immobilized on the surface through an irrelevant portion thereof, wherein the carrier surface has a portion wherein the antibodies are not immobilized and at least a part of the portion of the surface is coated with a protein having low interaction with antibodies (see entire document, Abstract in particular). GB '548 teaches several examples of said blocking protein , including casein, i.e. the same blocking protein that was used in the instant application. (see page 19 in particular). It is noted that GB '548 does not explicitly teaches that casein has been a subject to a treatment for reducing the metallic ion , prior to use as a blocking agent. However, it is noted that GB '548 does not limited said blocking peptide to any particular type of casein, thus referenced casein can be treated to remove or reduce the metallic ion. Moreover, both the prior art and the instant specification use casein only as a blocking agent. In other words both the prior art and the instant application only used casein to cover the portion of the surface of the carrier to prevent unspecific bonding to the carrier and the Specification does not teaches any advantage of using treated casein as a blocking agent compared to untreated casein. In addition, is noted that the instant claims are drawn to a product i.e. a carrier having immobilized antigen or antibodies and the patentability of the product does not depend on its method of production. In re Thrope, 227 USPQ 964,966 (Fed. Cir. 1985). See MPEP 2113. GB '548 teaches a carrier having immobilized antibodies wherein antibodies are stabilized by treating the carrier with stabilizing agent and the cross-linking agent that is glutaraldehyde (see overlapping pages 18-19 in particular). GB '548 teaches a carrier, wherein carrier is produced by colliding porous particles of calcium phosphate (see pages 8, 10 and example 1 in particular). GB '548 teaches a carrier having a substantially spherical shape (see Fig.1 2 and 3 in particular).

Similarly, GB'552 teaches a carrier having a surface formed of a calcium phosphate compound and antibody, immobilized on the surface through an irrelevant portion thereof, wherein the carrier surface has a portion wherein the antibodies are not immobilized and at least a part of the portion of the surface is coated with a protein having low interaction with antibodies (see entire document, Abstract in particular). GB'552 teaches several examples of said blocking protein , including casein, i.e. the same blocking protein that was used in the instant application. (see page 6 in particular). It is noted that GB '552 does not explicitly teaches that casein has been a subject to a treatment for reducing the metallic ion , prior to use as a blocking agent. However, it is noted that GB '552 does not limited said blocking peptide to any particular type of casein, thus referenced casein can be treated to remove or reduce the metallic ion. Moreover, both the prior art and the instant specification use casein only as a blocking agent. In other words both the prior art and the instant application only used casein to cover the portion of the surface of the carrier to prevent unspecific bonding to the carrier and the Specification does not teaches any advantage of using treated casein as a blocking agent compared to untreated casein. In addition, is noted that the instant claims are drawn to a product i.e. a carrier having immobilized antigen or antibodies and the patentability of the product does not depend on its method of production. In re Thrope, 227 USPQ 964,966 (Fed. Cir. 1985). See MPEP 2113. GB'552 teaches a carrier having immobilized antibodies wherein antibodies are stabilized by

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treating the carrier with stabilizing agent and the cross-linking agent that is glutaraldehyde (see page 6 in particular). GB'552 teaches a carrier, wherein carrier is produced by colliding porous particles of calcium phosphate (see pages 5, and examples 1 and 2 in particular).

GB'548 and GB'552 do not teach a carrier wherein carrier has antiligands thereon and an antibody has a ligand bonded thereto and antibody immobilized to the carrier through ligand/antiligand interaction, or wherein the antibodies are IgG .

US Patent '669 teaches a carrier, wherein said carrier have a surface which is formed of a calcium phosphate based compound with antiligands, such as avidin, or streptavidin being adsorbed and immobilized thereon (see entire document, Abstract and column 1, lines 30-68 and column 2, lines 40-60 in particular). US Patent '669 teaches an antibodies that have a ligand bonded thereto wherein a ligand is biotin that is immobilized to the carrier through biotin-avidin interaction (see, column 2, lines 1-5 and column 5, line 15-27 in particular). US Patent '669 teaches the avidin or streptavidin or derivatives thereof have a notable high affinity to a biotin and biotin can be easily bonded with antibody. Based on this specific properties a carrier was made in which antibody was immobilized with a good and right orientation. The good and right orientation is the result of the reaction between the avidin (antiligand) that was immobilized on the carrier and the biotinylated (ligand-bound) antibody. Using this carrier an easily and high sensitive detection can be performed (see column 5, lines 15-26 in particular). It is noted that the claimed "antiligands provided on and surrounding the surface of the carrier" would be an obvious properties of the carrier taught by '669 because the carrier is mixed with antiligand solution and would obviously be surrounded with antiligand.

US Patent '207 teaches a carrier having immobilized antibody, wherein antibody are IgG. (see entire document, column 7, lines 5-10 in particular). US Patent '207 teaches that there is a pragmatic need to maximized antibody loading and right orientation of said antibody on the carrier for optimizing process efficiency (see column 2, lines 1-15 in particular).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the teaching of US Patent '669 and US Patent '207 to those of GB'548 or GB'552 to obtain a claimed carrier having immobilized antibodies wherein the carrier has antiligands thereon and antibody has a ligand bonded thereto and wherein antibody is immobilized to the carrier through the ligand and the antiligand interaction and wherein antibody is IgG.

One of ordinary skill in the art at the time the invention was made would have been motivated to do so, because there is a pragmatic need to maximized antibody loading and right orientation of said antibody on the carrier, including IgG, for optimizing process efficiency as taught by US Patent '207 and the good and right orientation is the result of the reaction between the avidin (antiligand) that was immobilized on the carrier and the biotinylated (ligand-bound) antibody as taught by US Patent '669 . This type of the carrier can substitute the carrier taught by GB'548 and GB'552 for easily and high sensitive detection.

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From the combined teaching of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.


5. No claim is allowed.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michail Belyavskiy whose telephone number is 571/272-0840. The examiner can normally be reached Monday through Friday from 9:00 AM to 5:30 PM. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on 571/272-0841.

The fax number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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